

Amendments to the Claims

This listing of claims will replace all prior version and listings of claims in the application:

Listing of Claims:

1. (Original): A method for discriminating an agent, comprising the steps of:
 - a. constructing a decision tree having a plurality of branches, each branch corresponding to at least one defined action, wherein each branch comprises a plurality of successive branches, each successive branch corresponding to at least one defined action;
 - b. providing a conditioned environment sensitive to the agent;
 - c. obtaining data from response of the agent to the conditioned environment;
 - d. extracting features from the obtained data;
 - e. selecting a branch from the decision tree corresponding to the features;
 - f. performing on the features at least one defined action corresponding to the branch;
 - g. producing a classification of the agent; and
 - h. iteratively repeating steps of (d)-(g) until the agent is discriminated.
2. (Original): The method of claim 1, wherein the agent comprises a chemical agent.
3. (Original): The method of claim 1, wherein the agent comprises a non-chemical agent.
4. (Original): The method of claim 1, wherein the agent comprises a biological agent.
5. (Original): The method of claim 1, wherein the agent comprises a non-biological agent.
6. (Original): The method of claim 1, wherein the constructing step comprises the step of choosing logic for successive refinement of agent classification.

7. (Original): The method of claim 6, wherein the choosing step comprises the step of selecting logic for classification of a Neuro agent.
8. (Original): The method of claim 6, wherein the choosing step comprises the step of selecting logic for classification of a Viral agent.
9. (Original): The method of claim 1, wherein the providing step comprises the step of selecting of cell types to be exposed to the agent.
10. (Original): The method of claim 9, wherein the providing step further comprises the step of placing at least one cell of the selected cell types in the conditioned environment.
11. (Original): The method of claim 1, wherein the providing step comprises the step of selecting of reagent quantities.
12. (Original): The method of claim 1, wherein the providing step comprises the step of selecting of a desired assay.
13. (Original): The method of claim 1, wherein the selecting step comprises the step of selecting of a branch corresponding to at least one desired feature extraction algorithm from at least one library of algorithms.
14. (Original): The method of claim 1, wherein the producing step comprises the steps of:
 - a. determining a classification method from a library of classification methods; and
 - b. applying the classification method to the features to produce the classification.
15. (Withdrawn): A system for discriminating an agent, comprising:
 - a. means for constructing a decision tree having a plurality of branches, each branch corresponding to at least one defined action, wherein each branch comprises a plurality of successive branches, each successive branch corresponding to at least

- one defined action;
 - b. a conditioned environment sensitive to the agent;
 - c. means for obtaining data from response of the agent to the conditioned environment;
 - d. means for extracting features from the obtained data;
 - e. means for selecting a branch from the decision tree corresponding to the features;
 - f. means for performing on the features at least one defined action corresponding to the branch;
 - g. means for producing a classification of the agent; and
 - h. means for iteratively repeating certain tasks until the agent is discriminated.
16. (Withdrawn): The system of claim 15, wherein the agent comprises a chemical agent.
17. The system of claim 15, wherein the agent comprises a non-chemical agent.
18. (Withdrawn): The system of claim 15, wherein the agent comprises a biological agent.
19. (Withdrawn): The system of claim 15, wherein the agent comprises a non-biological agent.
20. (Withdrawn): The system of claim 15, wherein the constructing means comprises means for choosing logic for successive refinement of agent classification.
21. (Withdrawn): The system of claim 20, wherein the choosing means comprises means for selecting logic for classification of a Neuro agent.
22. (Withdrawn): The system of claim 7, wherein the choosing means comprises means for selecting logic for classification of a viral agent.
23. (Withdrawn): The system of claim 15, wherein the conditioned environment comprises a

plurality of cells to be exposed to the agent.

24. (Withdrawn): The system of claim 15, wherein the conditioned environment comprises a plurality of reagent quantities.
25. (Withdrawn): The system of claim 15, wherein the conditioned environment comprises a plurality of a desired assay.
26. (Withdrawn): The system of claim 15, wherein the selecting means comprises means for selecting of a branch corresponding to at least one desired feature extraction algorithm from at least one library of algorithms.
27. (Withdrawn): The system of claim 15, wherein the producing means comprises a controller performing the steps of:
 - a. determining a classification method from a library of classification methods; and
 - b. applying the classification method to the features to produce the classification.
28. (Original): A method for discriminating an agent, comprising the steps of:
 - a. providing a plurality of L parameters, L being an integer, each parameter being related to the status of the agent;
 - b. fitting the plurality of L parameters into a set of ith order differential equations, $i = 1, \dots, N$, N being an integer;
 - c. obtaining a plurality of L features corresponding to L parameters, respectively, from the set of ith order differential equations;
 - d. separating the L features into a plurality of classes with a corresponding confidence level;
 - e. providing a plurality of L+1 parameters, each parameter being related to the status of the agent;
 - f. fitting the plurality of L+1 parameters into a set of ith+1 order differential equations;

- g. obtaining a plurality of $L+1$ features corresponding to $L+1$ parameters, respectively, from the set of $i^{th}+1$ order differential equations;
 - h. separating the $L+1$ features into a plurality of classes with a corresponding confidence level; and
 - i. iteratively repeating steps (e)-(h) until a plurality of classes for the agent is separated with a desired corresponding confidence level.
29. (Original): The method of claim 28, wherein the agent comprises a chemical agent.
30. (Original): The method of claim 28, wherein the agent comprises a non-chemical agent.
31. (Original): The method of claim 28, wherein the agent comprises a biological agent.
32. (Original): The method of claim 28, wherein the agent comprises a non-biological agent.
33. (Original): The method of claim 28, wherein the parameters comprises a plurality of measurable physical quantities.
34. (Original): The method of claim 33, wherein the plurality of measurable physical quantities comprises measurable physical quantities related to metabolic status of a biological agent.
35. (Original): The method of claim 28, wherein the set of i^{th} order differential equations comprises a set of 1st order differential equations of metabolic pathways, signaling pathways, or gene expression interactions.
36. (Original): The method of claim 35, wherein the set of $i^{th}+1$ order differential equations comprises a set of 2nd order differential equations of metabolic pathways, signaling pathways, or gene expression interactions.

37. (Original): The method of claim 28, wherein each of the separating steps (d) and (h) comprises the step of separating corresponding features into a plurality of classes with one of a Principal-Component-Analysis/Cluster separation and a singular value decomposition.
38. (Withdrawn): A system for discriminating an agent, comprising a controller performing the steps of:
- a. providing a plurality of L parameters, L being an integer, each parameter being related to the status of the agent;
 - b. fitting the plurality of L parameters into a set of i th order differential equations, $i = 1, \dots, N$;
 - c. obtaining a plurality of L features corresponding to L parameters, respectively, from the set of i th order differential equations;
 - d. separating the L features into a plurality of classes with a corresponding confidence level;
 - e. providing a plurality of L+1 parameters, each parameter being related to the status of the agent;
 - f. fitting the plurality of L+1 parameters into a set of i th+1 order differential equations;
 - g. obtaining a plurality of L+1 features corresponding to L+1 parameters, respectively, from the set of i th+1 order differential equations;
 - h. separating the L+1 features into a plurality of classes with a corresponding confidence level; and
 - i. iteratively repeating steps (e)-(h) until a plurality of classes for the agent is separated with a desired corresponding confidence level.
39. (Withdrawn): The system of claim 38, wherein the agent comprises a chemical agent.
40. (Withdrawn): The system of claim 38, wherein the agent comprises a non-chemical agent.

41. (Withdrawn): The system of claim 38, wherein the agent comprises a biological agent.
42. (Withdrawn): The system of claim 38, wherein the agent comprises a non-biological agent.
43. (Withdrawn): The system of claim 38, wherein the parameters comprises a plurality of measurable physical quantities.
44. (Withdrawn): The system of claim 43, wherein the plurality of measurable physical quantities comprises measurable physical quantities related to metabolic status of a biological agent.
45. (Withdrawn): The system of claim 38, wherein the set of i th order differential equations comprises a set of 1st order differential equations of metabolic pathways, signaling pathways, or gene expression interactions.
46. (Withdrawn): The system of claim 45, wherein the set of i th+1 order differential equations comprises a set of 2nd order differential equations of metabolic pathways, signaling pathways, or gene expression interactions.
47. (Withdrawn): The system of claim 38, wherein each of the separating steps (d) and (h) comprises the step of separating corresponding features into a plurality of classes with one of a Principal-Component-Analysis/Cluster separation and a singular value composition.
48. (Original): A method for discriminating an agent, comprising the steps of:
 - a. providing a broad spectrum assay having a plurality of L cell lines, L being an integer, each cell line being able to respond to the agent;
 - b. measuring responses of cell line i , $i = 1, \dots, L$, to the agent;

- c. separating the responses into class m , $m = 1, \dots, O$, O being an integer and the total number of available classes, with a corresponding robustness factor;
 - d. selecting cell line j , $j = 1, \dots, L$ but $\neq i$, from the knowledge of class m ;
 - e. measuring responses of cell line j , $j = 1, \dots, L$ but $\neq i$, to the agent;
 - f. defining a set of feature extraction algorithms from the measured response of cell line j , $j = 1, \dots, L$ but $\neq i$;
 - g. selecting cell line k , $k = 1, \dots, L$ but $\neq i$ and $\neq j$;
 - h. measuring responses of cell line k , $k = 1, \dots, L$ but $\neq i$ and $\neq j$, to the agent;
 - i. separating the responses into class n , $n = 1, \dots, O$, O being an integer and the total number of available classes, with a corresponding robustness factor; and
 - j. iteratively repeating steps (f)-(i) until a class for the agent with a desired robustness factor is obtained.
49. (Original): The method of claim 48, wherein the agent comprises a chemical agent.
50. (Original): The method of claim 48, wherein the agent comprises a non-chemical agent.
51. (Original): The method of claim 48, wherein the agent comprises a biological agent.
52. (Original): The method of claim 48, wherein the agent comprises a non-biological agent.
53. (Original): The method of claim 48, wherein each of the separating steps (c) and (i) comprises the step of discriminating the responses with a Maximum Likelihood Estimator.
54. (Original): The method of claim 48, wherein the selecting step (d) comprises the step of selecting the cell line according to a desired sensitivity of the cell line.
55. (Original): The method of claim 48, wherein the defining step (f) comprises the step of using a classifier to define a set of feature extraction algorithms from the measured

response.

56. (Original): The method of claim 55, wherein the classifier comprises a threshold.
57. (Withdrawn): A system for discriminating an agent, comprising a controller performing the steps of:
- a. providing a broad spectrum assay having a plurality of L cell lines, L being an integer, each cell line being able to respond to the agent;
 - b. measuring responses of cell line i, $i = 1, \dots, L$, to the agent;
 - c. separating the responses into class m, $m = 1, \dots, O$, O being an integer and the total number of available classes, with a corresponding robustness factor;
 - d. selecting cell line j, $j = 1, \dots, L$ but $\neq i$, from the knowledge of class m;
 - e. measuring responses of cell line j, $j = 1, \dots, K$ but $\neq i$, to the agent;
 - f. defining a set of feature extraction algorithms from the measured response of cell line j, $j = 1, \dots, L$ but $\neq i$;
 - g. selecting cell line k, $k = 1, \dots, L$ but $\neq i$ and $\neq j$;
 - h. measuring responses of cell line k, $k = 1, \dots, L$ but $\neq i$ and $\neq j$, to the agent;
 - i. separating the responses into class n, $n = 1, \dots, O$, O being an integer and the total number of available classes, with a corresponding robustness factor; and
 - j. iteratively repeating steps (f)-(i) until a class for the agent with a desired robustness factor is obtained.
58. (Withdrawn): The system of claim 57, wherein the agent comprises a chemical agent.
59. (Withdrawn): The system of claim 57, wherein the agent comprises a non-chemical agent.
60. (Withdrawn): The system of claim 57, wherein the agent comprises a biological agent.
61. (Withdrawn): The system of claim 57, wherein the agent comprises a non-biological

agent.

62. (Withdrawn): The system of claim 57, wherein each of the separating steps (c) and (i) comprises the step of discriminating the responses with a Maximum Likelihood Estimator.
63. (Withdrawn): The system of claim 57, wherein the selecting step (d) comprises the step of selecting the cell line according to a desired sensitivity of the cell line.
64. (Withdrawn): The system of claim 57, wherein the defining step (f) comprises the step of using a classifier to define a set of feature extraction algorithms from the measured response.
65. (Withdrawn): The system of claim 64, wherein the classifier comprises a threshold.